

**Amendments to the Specification:**

Please amend the paragraph at page 34, lines 9-25 as follows:

The spot 60, where the DNA probe 61 bonded with the complementary sample DNA segment by hybridization exists, receives phosphor exciting light [[.]] that is irradiated by the fluorescent substance from the light irradiation means 71 to emit visible light with a longer wavelength. Accordingly, the semiconductor layer 23 in the sensor 20 directly underneath the spot 60 is excited by the visible light to produce a number of electron-hole pairs. During the charge storage period of the i-th line following to the reset period, the top gate driver 11 (means for applying a negative voltage) impresses a negative charge storage voltage to the top gate line 44 of the i-th line, and only the holes of positive charges are trapped by the semiconductor layer 23 and the channel protective film 24 thanks to negative electric field impressed to the top gate electrode 30, and the electrons are caused to repel against the electric field and result in discharging out of the sensor 20.

Please amend the paragraph at page 53, lines 5 to 18 (as amended in the Amendment filed on February 8, 2008) as follows:

In FIG. 13B, a relation between the thickness of the exciting light absorbing layer 34 and transmittances of the phosphor exciting light with a wavelength of 308 nm and fluorescence with a wavelength of ~~530~~ 520 nm is shown in a logarithmic graph. As shown in FIG. 13B, as the thickness of the exciting light absorbing layer 34 increases, the transmittance of the phosphor exciting light is lowered. When the thickness of the exciting light absorbing layer 34 is 100 nm or greater, the transmittance of the phosphor exciting light becomes  $1.0 \times 10^{-3}$  or less. On the other hand, the transmittance of the fluorescence is not low as much as that of the phosphor exciting light and is 50% or more irrespective of the thickness of the exciting light absorbing layer 34.

And please amend the paragraph at page 67, lines 4 to 23 (as amended in the Amendment filed on August 30, 2007) as follows:

As described above, the absorption edge of ITO of at least one of the conductive layer 32 and the top gate electrode 30 has been shifted to a greater energy side as the charge density increases. Therefore, by lessening the charge density, it enables ITO to absorb light of shorter wavelengths. In FIG. 13C, a relation of the thickness of the exciting light absorbing layer 34 to the phosphor exciting light with a wavelength of 308 nm and the transmittance of fluorescence with a wavelength of ~~530~~ 520 nm when the charge density of ITO of the conductive layer 32 or the top gate electrode 30 in the optical DNA sensor 1 with the configuration described in the third embodiment is set to  $1.0 \times 10^{19}$  [1/cm<sup>3</sup>] and the optical constant N of ITO is set to  $N(308\text{nm}) = 2.2 - 0.34i$  (wherein i is an imaginary unit). In comparison with FIG. 13B, where the charge densities of both conductive layer 32 and top gate electrode 30 exceed  ~~$1.0 \times 10^{19}$  [1/cm<sup>3</sup>]~~  $1.0 \times 10^{19}$  [1/cm<sup>3</sup>], it is noted that the phosphor exciting light with a wavelength of 308 nm is further shaded in the conductive layer 32 or the top gate electrode 30.